**STATEMENT OF**

**ALEXANDER KARSNER**

**ASSISTANT SECRETARY FOR ENERGY EFFICIENCY**
**AND RENEWABLE ENERGY**

**U.S. DEPARTMENT OF ENERGY**

**BEFORE THE**

**COMMITTEE ON ENERGY AND NATURAL RESOURCES**

**UNITED STATES SENATE**

**September 12, 2007**

Mr. Chairman, Members of the Committee, thank you for the opportunity to appear before you today to discuss the Department's work on energy efficient lighting technologies, and to provide comments on S. 2017, the Energy Efficient Lighting for a Brighter Tomorrow Act. While the Administration has not had the opportunity to coordinate all interagency views on the legislation, I am happy to provide you with some preliminary comments.

The Department generally agrees with the overall goal of S. 2017, which would increase efficiency levels for lighting and provide significant energy savings for our nation. DOE is presently working on standards for General Service Incandescent Lamps, General Service Incandescent Reflector Lamps and Fluorescent Lamps. These activities are included in the January 31, 2006 report to Congress and are covered by the Consent Decree requirements for appliance standards.[1] The analyses that DOE is performing will reveal both technical improvement opportunities and potential economic impacts for manufacturers and consumers. The Department, as always, is willing to share our technical analysis to help inform on-going discussions among industry members and other stakeholders on voluntary consensus standards.

In Section 101, the efficacy standards in the legislation are aggressive, and may require that manufacturers convert their incandescent production lines to halogen capsule/infrared coated lamps requiring substantial capital investment and cost increases to the consumer. The Department also has concerns with the schedule in section 101 for issuing standards. First the time allotted is not sufficient to accomplish the required activities. Secondly, the timing of a follow-up standard would not provide DOE, or the markets, time to gain sufficient experience and understanding of the previous standard. Since there would be very limited knowledge derived through implementation of the first standard, the second standard could be locked into the same technologies or efficiency levels as the standard just put into place.

In Section 107, DOE is concerned that Congress is directing $60 million of R&D investment into "general service lamps", a term that is not defined in the draft legislation. DOE recommends that this R&D program be authorized for a range of lighting technologies, not exclusively incandescent technologies.

Our Building Technologies Program is focused on rapid deployment and market penetration of compact fluorescent lighting, technological breakthroughs for solid-state lighting, and long-term research into next generation lighting. In addition, the Department is conducting national publicity campaigns to encourage consumer adoption of energy efficient technologies.

## COMPACT FLUORESCENT LIGHTING

Compact fluorescent lamps (CFLs) combine the energy efficiency of fluorescent lighting with the convenience and popularity of incandescent fixtures. CFLs can easily replace most incandescent bulbs, saving up to 75% of the initial lighting energy. Although CFLs cost more initially than comparable incandescent bulbs, they last 6,000–15,000 hours, up to 10 times longer than incandescent bulbs. Lighting accounts for approximately 12 percent of the average home's electricity bill. If every home in America replaced just one incandescent light bulb with

[1] The Consent Decree was filed in the Southern District of New York to settle the consolidated cases, *State of New York, et al. v. Bodman* and *Natural Resources Defense Council, Inc. v. Bodman*, which claimed that DOE missed statutory deadlines for rulemakings on appliance efficiency standards

an ENERGY STAR®-qualified CFL, the Nation would save enough energy to light more than 3 million homes annually. That's $600 million in annual energy cost savings, and a reduction in greenhouse gas emissions equivalent to taking 800,000 cars off the road. Industry and civic leaders have recognized this cost-effective appeal, and annually join the Department's continuous efforts to educate and energize the general public through efforts such as October's *Change a Light, Change the World* program. In addition, we have worked closely this year with Wal-Mart and other major national and local retailers to launch significant outreach campaigns that have improved store layouts to promote CFL sales and recycling.

One prominent example of DOE's education efforts is the 18seconds.org campaign, which engages the artistic, creative, and entertainment industry in a national, multi-generational effort to go beyond preaching to the converted and create an enduring educational campaign to promote energy efficiency through lighting. Based on the premise that it takes a consumer only 18 seconds to change a light bulb, the campaign partners with Yahoo and A.C. Nielson to elevate the prominence of energy efficiency, using new media to put consumer efficiency decisions on par with national efforts to reduce pollution in the 1970s, drug use in the 1980s, and smoking today. The website, www.18seconds.org, allows consumers to enter a zip code and immediately learn how many CFLs have been purchased in the area, and the economic, energy, and environmental benefits of that activity.

In order to further encourage consumer adoption of energy efficient technologies like CFLs, the Department has recently embarked upon an innovative partnership with the Walt Disney Corporation. DOE announced on June 14th that it has teamed up with Disney in a nationwide campaign to promote energy efficiency through a TV spot based on the Disney•Pixar film "Ratatouille." The 30-second animated spot features the characters from the movie, and urges viewers to make the switch from incandescent bulbs to ENERGY STAR® compact fluorescent lights. The spot, showcased nationwide during primetime viewing hours, reached more than 117 million households between June 15 and August 15, 2007, through networks including HGTV, Food Network and DIY.

Additionally, DOE created and produced posters using the main animation character, Remy, holding a CFL with the message, "Saving energy is easy. Make the switch today." The posters were distributed to state energy offices and will also be distributed to embassies. They are also available upon request through the EERE Resource Center. The poster is currently being translated into Chinese, Russian, French, Spanish and Arabic.

DOE is sponsoring a second round of public service announcements for national television network distribution for the fall DVD rollout. This additional advertising will air in October/November. In addition, the DOE – Disney CFL poster will be included in the DVD booklet with a projected distribution of 10 million units. The video spot and campaign poster are available online at the Department's website (www.energy.gov).

## SOLID STATE LIGHTING

DOE is working to advance the development and market introduction of energy-efficient white-light sources for general illumination using solid-state lighting (SSL), which differs fundamentally from today's lighting technologies. DOE has developed a coordinated approach

that guides technology advances from laboratory to marketplace by breaking out efforts into the following activities: Basic Energy Science, Core Technology Research, Product Development, Commercialization Support, Standards Development, and an SSL Partnership (competitively selected in 2005, the Next Generation Lighting Industry Alliance).

DOE partners with leading researchers from industry, academia, and national laboratories to accelerate advances in solid-state lighting. These researchers have made dramatic progress in just a few years, achieving several world records as well as national recognition. Since 2000, DOE-funded SSL research projects have applied for a total of 64 patents. DOE's goal is for general illumination SSL at 200 lumen/Watt, double the efficacy of today's best fluorescent lamps, by 2025. This year, DOE and its partners announced a breakthrough laboratory performance of 79 lumens/watt.

Collaborative, cost-shared, competitively-selected DOE R&D projects combine the technical resources of premier research institutions and national laboratories with the product development, manufacturing, and commercialization expertise of industry leaders. DOE invests in research projects that target the needed improvements in price, performance, and manufacturability to speed SSL technologies to market. The investments in research and development have led to major technological breakthroughs, including record brightness and efficacy levels for white light emitting diodes, as well as significant fabrication and packing advances. About 55 R&D projects are now in progress.

To ensure that DOE investments in core technology research and product development lead to SSL market penetration, DOE has developed a national strategy to guide market introduction of SSL for general illumination, including ENERGY STAR® labeling for SSL technologies and products, Lighting for Tomorrow design competition, LED product testing, standards and test procedures development, product demonstrations in buildings, and Fact Sheets for those who desire to learn the trade. The Department has about 150 partner organizations involved in our commercialization support activities.

The ENERGY STAR® label is a highly valued and widely recognized mark of energy efficiency that helps guide the American public to select cost-effective, energy-efficient products. The ENERGY STAR® program is jointly managed by the Department of Energy and the Environmental Protection Agency, with each agency taking the lead on a specific set of technologies.

As part of DOE's national strategy to accelerate market introduction of high efficiency SSL products, the Department is leading ENERGY STAR® management, specification development, and partner relations for SSL devices used for general illumination. The Department's ENERGY STAR® strategy for SSL general illumination products establishes a transitional two-category approach. Category A addresses near-term applications, where SSL technology can be appropriately applied. Category B establishes efficacy targets for a wider range of future applications, which will take effect once solid-state lighting technology is more mature. Eventually, Category A will be dropped, and category B will become the sole basis for the ENERGY STAR® criteria.

In December 2006, DOE released draft ENERGY STAR® criteria for SSL luminaires intended for general illumination. Following public review and comment, DOE issued second draft criteria in April 2007. The Department anticipates releasing final criteria shortly.

In addition, the Department is partnering with the Consortium for Energy Efficiency and American Lighting Association to challenge designers to develop high quality lighting fixtures that take advantage of the unique advantages of SSL through the Lighting for Tomorrow Competition. In 2006, eight SSL products were selected for recognition and we have the 2007 competition in progress.

## TEAM INITIATIVE

As I have indicated, we at the Department are focused on advancing the technical, commercial, and consumer outreach efforts on lighting. But I want stress that lighting alone is not sufficient to address our urgent energy security needs and the market penetration of new energy efficiency technologies. In fact, I encourage the Committee to think about comprehensive energy management efforts to radically transform the built environment.

DOE has begun an historic and very important transformation of its own. On August 8, 2007, Secretary Bodman launched the Transformational Energy Action Management (TEAM) Initiative, a Department-wide effort aimed at, among other things, reducing energy intensity across the national DOE complex by 30 percent. The TEAM Initiative aims to have the Department of Energy lead, meet or exceed the aggressive goals established by the President for increasing energy efficiency throughout the federal government. Reducing energy intensity by 30 percent across the DOE complex will save millions in taxpayer dollars per year, after projects are paid for.

This Initiative will meet or exceed energy efficiency goals mandated by the EPACT 2005, as well as President Bush's Executive Order 13423, announced in January 2007. The Executive Order directs federal agencies to: reduce energy intensity and associated greenhouse gas emissions; substantially increase use and efficiency of renewable energy technologies; adopt sustainable design practices; and reduce petroleum use in Federal fleets. The TEAM Initiative adopts an even more ambitious timeline than required in the Executive Order.

The Secretary has instructed all DOE sites to host private sector energy service companies to assess efficiency opportunities across the complex, addressing all lifecycle, cost-competitive options. Lighting, including advanced fluorescents, solid state lighting, controls, daylighting, and integrated systems are easily one of the most cost-effective options for achieving the TEAM initiative targets. Secretary Bodman expects the Department to lead by example throughout the Federal Government, deploying a wide variety of lighting and other advanced technologies to achieve maximum energy savings.

The important information that I want to leave with you about the TEAM Initiative is that we are NOT stopping with the issue of lighting. We're looking at every DOE site, every building, and expecting every DOE site, primarily through the use of alternative financing through the private sector, to deploy ALL cost-effective energy efficient and renewable technologies in the service

of obtaining state-of-the-art and sustainable results for DOE and to demonstrate these best practices for the rest of the Federal government.

Even with the best lighting improvements, if we did not take advantage of those opportunities by pairing them with other energy conservation measures, we would not be maximizing the energy savings potential of these technologies. For example, heating and cooling systems in a building must account for the reduced heating and cooling load of new lighting technologies. The savings we are looking for at the scale needed to make a dent in our energy use cannot be accomplished with only one technology. Buildings are systems and we must view them holistically to get the desired results. Energy Saving Performance Contracting – established by Congress and endorsed repeatedly by this Committee -- is the key to our success.

The Secretary's TEAM Initiative is bold and, as Congress looks to "green" the Capitol Complex, I would be pleased to provide additional information and periodic updates to this Committee on our efforts and actions. As a first step, the Department is working with an energy savings performance contractor to transform its headquarters buildings into showcases of energy efficiency and advanced technology. In that ESPC, we will showcase the lighting technologies I have discussed in my testimony. We will deploy advanced technologies in different locations throughout the headquarters complex so that we can learn, while also demonstrating how these major improvements can benefit our economy and environment.

## CONCLUSION

I would like to conclude by thanking the Committee for its commitment to improving energy efficiency in so many ways. The Administration is committed to diversifying our nation's energy portfolio, and efficiency gains are the most easily accessible source of "new energy." Increasing the market penetration of efficient consumer products provides a very effective step toward reducing energy intensity and helping ensure a sustainable energy future. We must focus on these technologies and how they fit into the transformation of the entire built environment to get the best results. The Department looks forward to working with this Committee to resolve technical aspects of S. 2017 and to continue advancing the state of the art in lighting technologies.

Mr. Chairman, this concludes my prepared statement. I would be happy to answer any questions the Committee Members may have.